SECTION 46 70 00
WATER AND WASTEWATER RESIDUAL AND HANDLING TREATMENT

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PART 1 GENERAL

1.1 SECTION INCLUDES

A. Zapzorb P6 Blend, superabsorbent polymer and wood flour blend.

B. Zapzorb Fine Super Absorbent Polymer, surface cross-linked sodium polyacrylate superabsorbent polymer.

C. Zapzorb Original, surface cross-linked sodium polyacrylate superabsorbent polymer.

1.2 RELATED SECTIONS

A. Section 02 50 00 - Site Remediation.

B. Section 02 60 00 - Contaminated Site Material Removal.

C. Section 02 70 00 - Water Remediation.

D. Section 31 10 00 - Site Clearing.

E. Section 31 23 00 - Excavation and Fill.

F. Section 31 23 00 - Soil Stabilization.

G. Section 46 05 00 - Common Work Results for Water and Wastewater Equipment.

H. Section 46 20 00 - Water and Wastewater Preliminary Treatment Equipment.

I. Section 46 50 00 - Water and Wastewater Secondary Treatment Equipment.

J. Section 46 71 00 - Residuals Thickening Equipment.

K. Section 46 73 00 - Residuals Stabilization Equipment.

L. Section 46 76 00 - Residuals Dewatering Equipment.

M. Section 46 78 00 - Thermal Treatment of Residuals.

1.3 REFERENCES

A. Environmental Protection Agency (EPA):
   1. SW-846, Test Method 9095B - Paint Filter Liquids Test.

B. Organisation for Economic Co-operation and Development (OECD):
   1. OECD Test Guideline 301B - Ready Biodegradability CO2 Evolution Test, Modified Sturm Test.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00.

B. Product Data:
   1. Manufacturer's data sheets on each product to be used.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Typical application methods.

C. Verification Samples: Two representative units of each type and granule size.

D. Work Plan: Submit a comprehensive plan prior to commencement of the Work. Document entire sequence of operations. Plan must include, at minimum, the following:
   1. Safety and Logistic: Mobilization plan, equipment list, safety protocols, and storage procedures for the solidifying agent.
   2. Dosage and Mixing Procedure: Detailed methodology for determining the required amendment rate, within the weight by weight range, based on site-specific waste characteristics. Include sequence and equipment used for mechanical mixing of superabsorbent polymer into waste.
   3. Quality Control and Testing Protocol: A sampling and testing plan detailing the frequency and protocol for verifying that the treated waste meets the Free Liquid Content performance requirement using Method 9095B.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum of five years documented experience.

B. Contractor Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.

C. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

1.6 PRE-CONSTRUCTION CONFERENCE

A. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Engineer, Contractor and trades involved. Agenda shall include schedule, responsibilities, work plan, critical path items and approvals.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store in original, unopened packaging in dry conditions, protected from direct UV exposure on elevated pallets protected by moisture-proof covers, and in a manner that prevents direct contact with water, rain, wastewater, or high humidity.

B. Handle in strict compliance with manufacturer's written instructions and recommendations.

C. Protect from damage due to excessive temperature, and construction operations.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not apply products under environmental conditions outside manufacturer's recommended limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Chase Corporation, which is located at:
375 University Ave.
Westwood, MA 02090
Tel: 781-750-0525
Fax: 781-332-0701
Email:request info (insidesales@chasecorp.com);Web:https://chasecorp.com

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with the provisions of Section 01 60 00.

2.2 SUPERABSORBENT SOLIDIFYING AGENTS

A. Basis of Design: Zapzorb P6 Blend, as manufactured and supplied by Zappa Stewart.
1. Free flowing granules, superabsorbent polymer and wood flour blend designed for rapid solidification of high-solids and liquid-bearing wastes at minimal amendment rates.
2. Performance and Design Requirements:
a. Standards Compliance:
1) EPA SW-846 Test Method 9095B.
b. Performance Requirements:
1) Absorption Capacity, Distilled Water: 200 lbs (200 g) water per 1 lb (1 g) product.
2) Application Rate: 0.25 percent solidifying agent to 1 percent waste weight, measured on a weight by weight basis.
3) Moisture: 11-14 percent.
4) pH: 5.5-6.5 standard units.
c. Design Requirements:
1) Bulk Density: 22.5-29.3 lbs ft3 (0.36-0,47 g cm3).
d. Packaging: 50 lb bag (22.68 kg).
e. Shipping Weight: 52 lbs (23.59 kg).

B. Basis of Design: Zapzorb Fine Super Absorbent Polymer, as manufactured and supplied by Zappa Stewart.
1. Free flowing granules, surface cross-linked sodium polyacrylate superabsorbent polymer featuring a small particle size distribution for elite hydration speed. Engineered to rapidly solidify a wide range of liquid-bearing wastes with minimal amendment rates.
2. Performance and Design Requirements:
a. Standards Compliance:
1) EPA SW-846 Test Method 9095B.
2) OECD Test Guideline 301B.
b. Performance Requirements:
1) Absorption Capacity, Distilled Water: 220 lbs (220 g) water per 1 lb (1 g) product.
2) Application Rate: 0.5 percent solidifying agent to 1.5 percent waste

weight, measured on a weight by weight basis.
3) Moisture: Less than 10 percent.
4) pH: 5.5-6.5 standard units.
c. Design Requirements:
1) Particle Size Distribution: US Sieve No. 50, 0-0.0118 inch (0-300 microns).
2) Bulk Density: 37.5-56.2 lbs ft3 (0.6-0.9 g cm3).
d. Packaging: 50 lb bag (22.68 kg).
e. Shipping Weight: 52 lbs (23.59 kg).

C. Basis of Design: Zapzorb Original, as manufactured and supplied by Zappa Stewart.
1. Free flowing granules, surface cross-linked sodium polyacrylate superabsorbent polymer featuring a consistent particle size distribution, rapidly solidifies a wide range of liquid-bearing wastes with minimal amendment rates.
2. Performance and Design Requirements:
a. Standards Compliance:
1) EPA SW-846 Test Method 9095B.
2) OECD Test Guideline 301B.
b. Performance Requirements:
1) Absorption Capacity, Distilled Water: 300-400 lbs (300-400 g) water per 1 lb (1 g) product.
2) Application Rate: 0.5 percent solidifying agent to 1.5 percent waste weight, measured on a weight by weight basis.
3) Moisture: Less than 10 percent.
4) pH: 5.5-6.5 standard units.
c. Design Requirements:
1) Particle Size Distribution: 0.0039-0.035 to inch (100-900 microns).
2) Bulk Density: 34.3-46.8 lbs ft3 (0.55-0.75 g cm3).
d. Packaging: 50 lb bag (22.68 kg).
e. Shipping Weight: 52 lbs (23.59 kg).

PART 3 EXECUTION

3.1 EXAMINATION

A. Residuals Condition and Volume: Prior to commencing solidification work each day, examine the wastewater residuals, sludge, and biosolids to be treated for the following:
1. Volume: Verify the available volume in the storage or staging area.
2. Consistency: Observe the consistency, moisture content, and temperature of the residuals to anticipate amendment rate variations.
3. Regulatory Compliance: Confirm that the staging or mixing area meets all applicable local and federal regulations for waste handling.

B. Equipment and Supply: Examine all mixing equipment, conveying systems, and the inventory of solidifying agent to ensure they are clean, in good working order, and sufficient for the daily planned work.

C. If the residuals or site conditions are unsatisfactory, such as highly variable moisture, contaminated mix area, or insufficient access, notify the Engineer in writing before proceeding.

3.2 PREPARATION

A. Amendment Rate Determination: Establish the minimum effective amendment rate for solidifying agent to achieve the required stability.
1. Perform a site-specific, bench-scale trial mix for each change in residuals consistency or batch.

2. The resulting mixture must meet the Pass/Fail criteria for stability, typically defined as no free liquids as determined by the EPA Paint Filter Liquids Test, Method 9095B.
3. Dosage of solidifying agent must be strictly maintained within the minimum and maximum amendment rates specified in Part 2 - Products of this Section, and must achieve required performance criteria without exceeding the specified maximum amendment rate. The minimum rate is the prescribed starting point for trial mixes.

B. Mixing Equipment Preparation: Clean mixing equipment of foreign matter. Ensure all equipment is positioned to allow for efficient and contained introduction of the residuals and the solidification media.

C. Material Introduction: Introduce the wastewater residuals and solidifying agent into the mixing equipment.

3.3 SOLIDIFICATION AND DISPOSAL

A. Solidification Process: Mechanically mix residuals and solidifying agent for a sufficient duration, according to manufacturer's written instructions, to ensure homogeneous distribution of the polymer and complete chemical reaction.

B. Handling and Disposal: Handle, convey, and load stabilized and tested material directly into transportation units for disposal at an approved facility, in accordance with Section 01 50 00 - Temporary Facilities and 31 23 00 - Excavation and Fill, or as directed by the Engineer.

3.4 FIELD QUALITY CONTROL

A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

B. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.

C. Field Quality Control Testing: After mixing, immediately perform EPA Paint Filter Liquids Test Method 9095B on a representative sample of the solidified material.
1. Material that fails testing and shows free liquids must be re-amended with additional solidifying agent and re-tested until compliant.
2. Maintain a log of all tests, amendment rates, and time of treatment for submission to the Engineer.

3.5 CLEANING AND PROTECTION

A. Cleanup of Spills: Immediately clean and dispose of any spillage of solidifying agent, both dry or wet, in accordance with the manufacturer's written instructions and local regulations. Do not use water to clean up dry spills.

B. Do not allow spills of solidifying agent to enter storm drains or the wastewater treatment facility's process train.

END OF SECTION